



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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11-13-02
Patent NP

In re patent application of: PRYOR

Serial No.: 09/435,854

Filed: 8 November 1999

For: A METHOD FOR PROVIDING HUMAN INPUT TO A
COMPUTER

Examiner: Abdulsalam

Art Unit: 2674

Docket No.: P00891US3/DEJ

RESPONSE

Commissioner for Patents
Washington, D.C.

RECEIVED

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Technology Center 2600

S I R:

In the third Office Action dated May 7, 2002, the outstanding final rejection was withdrawn and a new non-final rejection of the pending claims was made under 35 USC § 102. In this rejection, claims 1-22 and 27 were rejected as being anticipated by the Zimmerman patent. However, for the following reasons, it is submitted that claims 1-22 and 27 are all allowable over this reference.

It is initially noted that the Zimmerman patent first applied by the examiner in the outstanding Office Action and cited in the attached Notice of References Cited was previously cited in the IDS filed by applicant on February 8, 2000. The consideration of those listed references was acknowledged by the examiner in the previous (final) Office Action, so that those references were already made of record. Therefore, to avoid duplication, the Zimmerman patent now listed (again) in the Notice should be omitted or deleted therefrom if the application issues.

The applied Zimmerman patent discloses a computer data entry and manipulation apparatus including a glove assembly 12 electrically coupled via a cable

13 to an interface circuit 14. The interface circuit is in turn connected to a port of the associated computer having a display screen 28. The glove assembly contains sensors that detect flexing of the fingers of the user or other hand gestures. Such a glove assembly is cumbersome and not very user friendly, except for limitation applications.

The glove assembly of the Zimmerman patent also includes one or more ultrasonic transducers 17 for transmitting signals to receivers 20 located around the display screen 28, so that the spatial position of the glove assembly 12 with respect to display screen 28 can be determined. This determination is made by measuring a time delay between a transmission of an ultrasonic signal by the (each successive?) transducer 17 and a reception of the signal by receivers 20. These transducers also require a wire connection to the computer, for power as well as for an initiation signal (for the timing measurement to be made). Such a wire connection is obviously quite inhibiting unless movement is restricted to a small area and quick movements are not anticipated.

In use of the device of the Zimmerman patent, a virtual object is displayed on the display screen 28. The user's hand movements in the glove assembly as well as with the glove assembly control the movement of a cursor on the display screen 28 relative to the displayed object (such as a keyboard). Thus, typing or the like can be mimicked by the user relative to the displayed keyboard and position of the cursor thereon.

In the present invention as claimed in independent claims 1, 5, 21 and 27, the determining of the position of one or more points on a user or object is performed "optically" or with "optical images". Such an optical determination provides a much greater real-time determination which is required for the applications disclosed in the

present application. This optical determination also provides an application to broader, more varied, and/or even multiple elements to be tracked (whole body, hand, hands and feet, other objects, etc. - as further claimed in the dependent claims). In the Zimmerman patent, if multiple location points of the glove assembly are to be determined, it would be time consuming as each point would have to be measured successively with the already inherent time delay measurement of one point then delaying the measurement of the next point (which could have moved substantially during the first point measurement). In other words, the measurement of three (or more) points simultaneously, as required to determine orientation, would not be realistic in the device of the Zimmerman patent, but is readily accomplished with the optical images used in the present invention.

In addition, it will be appreciated that the use of ultrasonics is applicable only to controlled environments, due to problems with ultrasonic sensing which can arise from unwanted changes (or gradients) in temperature or humidity. The optical sensing of the present invention is thus much more adaptable and usable in almost any environment and over large areas.

The present invention further provides a much simpler way of tracking movements, which also is much cheaper than the complicated glove assembly of the Zimmerman patent. The real-time determinations and varied applications of the present invention are not anticipated in the Zimmerman patent, where a much slower response is satisfactory - and evidently desired, as the use of a camera is specifically disclaimed (see claim 40) - and a more limited application is evidently intended.

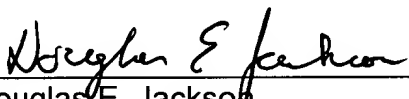
Therefore, for all of the foregoing reasons, it is submitted that independent claims 1, 5, 21 and 27 are neither anticipated nor made obvious by the Zimmerman patent so that these claims are all allowable. For these same reasons, it is submitted that dependent claims 2-4, 6-20 and 22 are also allowable.

The remaining references which were cited but not applied have been reviewed but are not believed to be pertinent to the patentability of the present invention.

For all of the foregoing reasons, it is submitted that the present application is in condition for allowance and such action is solicited.

Respectfully submitted,

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